

WHAT IS CLAIMED IS:

1 1. A system for optimizing state machine
2 transitional performance in a high speed link (HSL)
3 protocol stack at an application node disposed in a
4 network, comprising:

5 an input event decoder for decoding an input
6 event including at least a service access point (SAP) and
7 a connection identifier (CID) associated with a service
8 provider layer operating pursuant to a protocol layer
9 service for a particular connection link;

10 a state decoder for decoding state-specific
11 context information retrieved by a context switch control
12 block from a context memory based on said SAP and CID;
13 and

14 a generic state machine (GSM) logic structure
15 operable to be personalizable based said state-specific
16 context information, said GSM logic structure having a
17 state logic package partitionable into a control plane
18 and a data plane, said control plane operating to process
19 said decoded input event based on said decoded state-
20 specific context information and said data plane
21 operating to process data operations relating to said
22 protocol layer service, wherein said control and data
23 planes are operable to exchange layer parameters for said
24 service provider layer.

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1 2. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 1, further comprising a tester block for performing
5 tests on input parametric information extracted from said
6 decoded input event and said decoded state-specific
7 context information.

1 3. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 2, further comprising an operations module for
5 performing cyclical redundancy check (CRC) operations and
6 protocol overhead operations on input parametric
7 information extracted from said decoded input event and
8 said decoded state-specific context information.

1 4. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 3, wherein said control plane is operable to
5 receive test output from said tester block.

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1 5. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 4, wherein said control plane is operable to
5 provide control input to said operations module.

1 6. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 5, further including:

5 an output event encoder for generating a coded
6 output event based on output provided by said control
7 plane and said operations module; and

8 a state encoder for generating a coded next-
9 state information based on next-state output provided by
10 said control plane and on parametric output provided by
11 said operations module.

1 7. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein a first plurality of delay registers are
5 disposed between said tester block and said control
6 plane's protocol state machine and a second plurality of
7 delay registers are disposed between said operations
8 module and said control plane's protocol state machine,
9 said first and second plurality of delay registers
10 operating to control routing delays between said control
11 and data planes.

1 8. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as a Service Specific Coordination
6 Function (SSCF) control state machine based on said
7 state-specific context information retrieved from said
8 context memory.

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1 9. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as an Asynchronous Transfer Mode (ATM)
6 Adaptation Layer (AAL) control state machine based on
7 said state-specific context information retrieved from
8 said context memory.

1 10. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as a Service Specific Connection Oriented
6 Protocol (SSCOP) control state machine based on said
7 state-specific context information in said context
8 memory.

1 11. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as a state machine operating to transfer
6 SSCOP layer data based on said state-specific context
7 information in said context memory.

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1 12. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as a state machine operating to transfer
6 SSCF layer data based on said state-specific context
7 information in said context memory.

1 13. The system for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 6, wherein said GSM logic structure is
5 personalizable as a state machine operating to transfer
6 AAL layer data based on said state-specific context
7 information in said context memory.

1 14. A method for optimizing state machine
2 transitional performance in a high speed link (HSL)
3 protocol stack at an application node disposed in a
4 network, comprising the steps of:

5 pursuant to effectuating a protocol layer
6 service with respect to said HSL protocol stack,
7 receiving coded input event information and coded state-
8 specific context information relating to a select
9 protocol layer to be decoded by a decoder block;

10 personalizing a generic state machine (GSM)
11 logic structure based on said decoded state-specific
12 context information, said GSM logic structure having a
13 state logic package partitionable into a control plane
14 and a data plane, said control plane operating to process
15 at least a portion of said decoded input event
16 information based on said decoded state-specific context
17 information and said data plane operating to process data
18 operations relating to said protocol layer service;

19 providing, substantially in parallel with said
20 control plane's operation, at least a portion of said
21 decoded input event information and said decoded state-
22 specific context information to a tester block for
23 performing tests on input parametric information
24 extracted from said portions of said decoded input event
25 information and said decoded state-specific context
26 information, wherein said tester block is operable to
27 provide tester output to said control plane's state
28 machine;

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29 providing, substantially in parallel with said
30 control plane's operation, at least a portion of said
31 decoded input event information and said decoded state-
32 specific context information to an operations module for
33 performing protocol-specific operations on input
34 parametric information extracted from said portions of
35 said decoded input event information and said decoded
36 state-specific context information and based on control
37 signal information provided by said control plane's state
38 machine; and

generating coded output event information and coded next-state context information based on outputs provided by said control plane's state machine and said operations module, wherein said coded output event information and said coded next-state context information are operable to be provided as an input to an adjacent protocol layer associated with said protocol layer service.

1 15. The method for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 14, wherein said decoder block comprises an input
5 event decoder for decoding said input event information
6 and a state decoder for decoding said state-specific
7 context information.

1 16. The method for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 15, wherein said protocol-specific operations
5 performed by said operations module comprises at least
6 one cyclical redundancy check (CRC) operation.

1 17. The method for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 16, wherein said protocol-specific operations
5 performed by said operations module comprises protocol
6 overhead operations.

1 18. The method for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 17, wherein said tester block is operable to
5 perform at least one of a plurality of sequence number
6 tests and other tests on inputs.

1 19. The method for optimizing state machine
2 transitional performance in an HSL protocol stack at an
3 application node disposed in a network as set forth in
4 claim 18, wherein said select protocol layer comprises a
5 Service Specific Connection Oriented Protocol (SSCOP)
6 layer.

1 20. The method for optimizing state machine
2 transitional performance in a high speed link (HSL)
3 protocol stack at an application node disposed in a
4 network as set forth in claim 18, wherein said select
5 protocol layer comprises an Asynchronous Transfer Mode
6 (ATM) Adaptation Layer (AAL).

1 21. The method for optimizing state machine
2 transitional performance in a high speed link (HSL)
3 protocol stack at an application node disposed in a
4 network as set forth in claim 18, wherein said select
5 protocol layer comprises a Service Specific Coordination
6 Function (SSCF) layer.